

Appln No. 10/648,943
Amdt date April 18, 2005
Reply to Office action of March 8, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A traffic control signal comprising:
a structure having traffic control indicia formed thereon;
two or more LEDs mounted on the structure, each LED having an output light intensity of at least 6,000 millicandella, wherein each such LED is disconnectable without interrupting the operation of any other such LED, and wherein each such LED is individually mounted on approximately the same plane and separate from one another to provide discrete points of light as viewed by oncoming traffic when approaching said structure;
a power source for providing direct current to the two or more LEDs mounted on the structure; and
a control circuit for regulating a duty cycle of the two or more LEDs to operate at some desired blink frequency.
2. (Original) The traffic control signal as recited in claim 1, wherein each LED has an output intensity of greater than 6,000 millicandella.
3. (Original) The traffic control signal as recited in claim 1, wherein the power source comprises an external supply of suitable electrical power or a battery which can be recharged from an external supply of suitable electric power.
4. (Original) The traffic control signal as recited in claim 1, wherein the power source comprises a suitable solar photovoltaic panel suitably configured to charge a suitable rechargeable battery.

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5. (Original) The traffic control signal as recited in claim 4, wherein the solar photovoltaic panel provides an output voltage roughly in proportion to ambient light intensity, which varies in accordance with day or night conditions.

6. (Original) The traffic control signal as recited in claim 5, wherein the control circuit regulates the output light intensity of the two or more LEDs roughly in proportion to the ambient light intensity.

7. (Original) The traffic control signal as recited in claim 4, wherein the rechargeable battery is a nickel metal hydride battery.

8. (Original) The traffic control signal as recited in claim 1, wherein the structure defines a stop sign.

9. (Original) The traffic control signal as recited in claim 1, wherein the structure is selected from conventional traffic signs selected from a group consisting of:

red regulatory signs, including stop, do not enter, wrong way, yield, no U turn, and no left turn signs;

white regulatory signs, including speed limit, one-way, direction arrows, no turns, do not pass, pass with care, no turns, stop here on red, car pools only, trucks use right lane, and keep right signs;

yellow warning signs, including curve warning, stop ahead, yield ahead, road narrows, bump, loose gravel, pavement ends, truck crossing, lane ends, merge, loose gravel, and caution signs;

orange construction signs, including road work ahead, soft shoulder, detour ahead, slow, low shoulder, one lane road, construction ahead, and detour signs, and;

blue information signs, including call box, rest area, and police signs.

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10. (Original) The traffic control signal as recited in claim 9, wherein the two or more LEDs have similar color as the color of the traffic sign.

11. (Original) The traffic control signal as recited in claim 9, wherein the two or more LEDs used with the white speed limit sign are amber or yellow in color.

12. (Original) The traffic control signal as recited in claim 1, wherein the structure defines a traffic sign.

13. (Original) The traffic control signal as recited in claim 1, wherein the structure comprises a hand-held paddle suitable for use by road work crews, school crossing guards, emergency crews including firemen and police officers, and other types of workers on public or private roadways.

14. (Original) The traffic control signal as recited in claim 1, wherein the control circuit is coupled to the two or more LEDs so as to define duty cycles that can optionally be changed.

15. (Original) The traffic control signal as recited in claim 1, further comprising a control circuit coupled to the two or more LEDs so as to define a variable duty cycle.

16. (Original) The traffic control signal as recited in claim 1, wherein the two or more LEDs include an optical collimating lens for focusing the output light into a cone having an illumination angle approximately 20 degrees or less.

17. (Original) The traffic control signal as recited in claim 1, wherein the two or more LEDs are each enclosed in a waterproof housing and wherein the waterproof housing is mounted on the structure.

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18. (Original) The traffic control signal as recited in claim 1, wherein the two or more LEDs have a same general color as a background color of the structure on which the two or more LEDs are mounted.

19. (Original) The traffic control signal as recited in claim 1, wherein the two or more LEDs are mounted at a periphery of the structure to define a visual target area formed by the two or more LEDs when the two or more LEDs blink, wherein the mounting arrangement of the two or more LEDs approximately defines maximum dimensions of the structure.

20. (Original) The traffic control signal as recited in claim 1, further comprising an external power port for coupling an external power source to effect illumination of the two or more LEDs.

21. (Original) A method for enhancing visibility of conventional traffic signs or structures by mounting two or more discrete LEDs thereupon, directing the two or more LEDs such that an output light from each LED is aimed approximately towards oncoming traffic, positioning the two or more LEDs so as to form a recognizable geometric pattern and approximately defining a physical size of the sign or structure, wherein each of said one or more LEDs:

provides an output light intensity of 6,000 millicandella or more;

is disconnectable without interrupting the operation of any other such LED;

is provided with a suitable source of direct current electrical power; and

is caused to blink at a desired frequency by a suitable blink cycle timer and control circuit.

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22. (Original) The traffic control signal as recited in claim 21, wherein the two or more LEDs are mounted at the periphery of the sign or structure to define a visual target area formed by the two or more LEDs as the two or more LEDs blink.

23. (Original) The traffic control signal as recited in claim 21, wherein the two or more LEDs have a same general color as a primary background color of the sign or structure on which the two or more LEDs are mounted.

24. (Original) A method for enhancing visual perception of a traffic sign comprising a structure, the method comprising:

mounting two or more LEDs on the structure such that an output light from each LED is aimed approximately towards oncoming motor vehicle traffic, wherein the two or more LEDs are located at vertices or midpoints between vertices along at least a portion of a periphery of the structure to visually define a physical size of the structure with blinking of the two or more LEDs;

connecting the two or more LEDs with an electrical power source and with a blink cycle timer such that the electrical power energizes the blink cycle timer which then causes the two or more LEDs to blink, wherein the electrical power is derived either from an external source of electric power or from sunlight by suitable solar photovoltaic panel and rechargeable battery means; and

wherein each of the two or more LEDs:

provides an output light intensity of at least 6,000 millicandella, and

is electrically disconnectable from the electrical power without interrupting the blinking operation of any remaining LEDs.

25. (Original) A method for enhancing the visibility of a traffic sign, the method comprising:

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mounting two or more LEDs on a traffic control structure, each of the one or more LEDs being configured such that:

output light of each LED forms a cone angle less than approximately 20 degrees;
output light intensity of each LED is at least 6,000 millicandella; and
each LED is aimed approximately towards oncoming motor vehicle traffic.

26. (Original) A method for enhancing visibility of conventional traffic signs or structures by mounting two or more LEDs thereupon such that output light from each LED is aimed approximately towards oncoming motor vehicle traffic, wherein each LED:

is disconnectable from the traffic sign or structure without interrupting the blinking operation of any remaining LEDs;

provides an output light intensity of 6,000 millicandella or more; and

is provided with suitable direct current electrical power derived from a suitable source, wherein a suitable control circuit and blink cycle timer means is used to effect illumination of the two or more LEDs.

27. (Original) The method of claim 26, further comprising a duty cycle control circuit coupled to the two or more LEDs so as to define a variable duty cycle for the two or more LEDs.

28. (Original) The method of claim 26, further comprising an external power port for coupling an external power source is used to effect illumination two or more LEDs.

29. (Original) The method of claim 26, further comprising an override control circuit for facilitating external control of the LEDs.

30. (Original) The method of claim 26, further comprising a multiple sign control circuit configured to facilitate control of LEDs on a plurality of traffic control signs.